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BLACK & VEATCH



## **RETI Phase 2 Update Workgroup**

**Black & Veatch: Ryan Pletka**

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## Announcement

### **Black & Veatch has moved!**

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## Agenda

- Review of updated out-of-state analysis

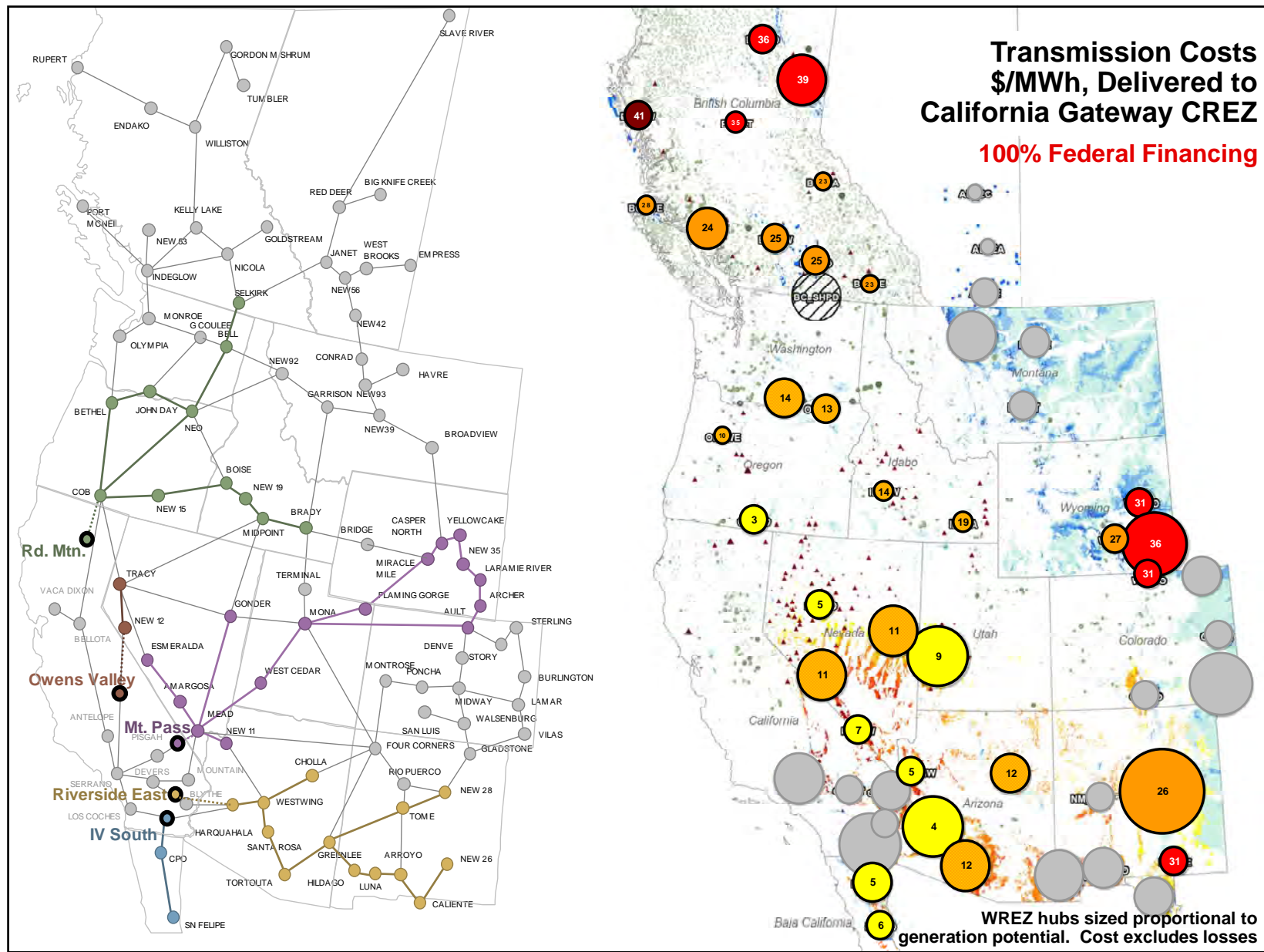
# Out-of-State Update

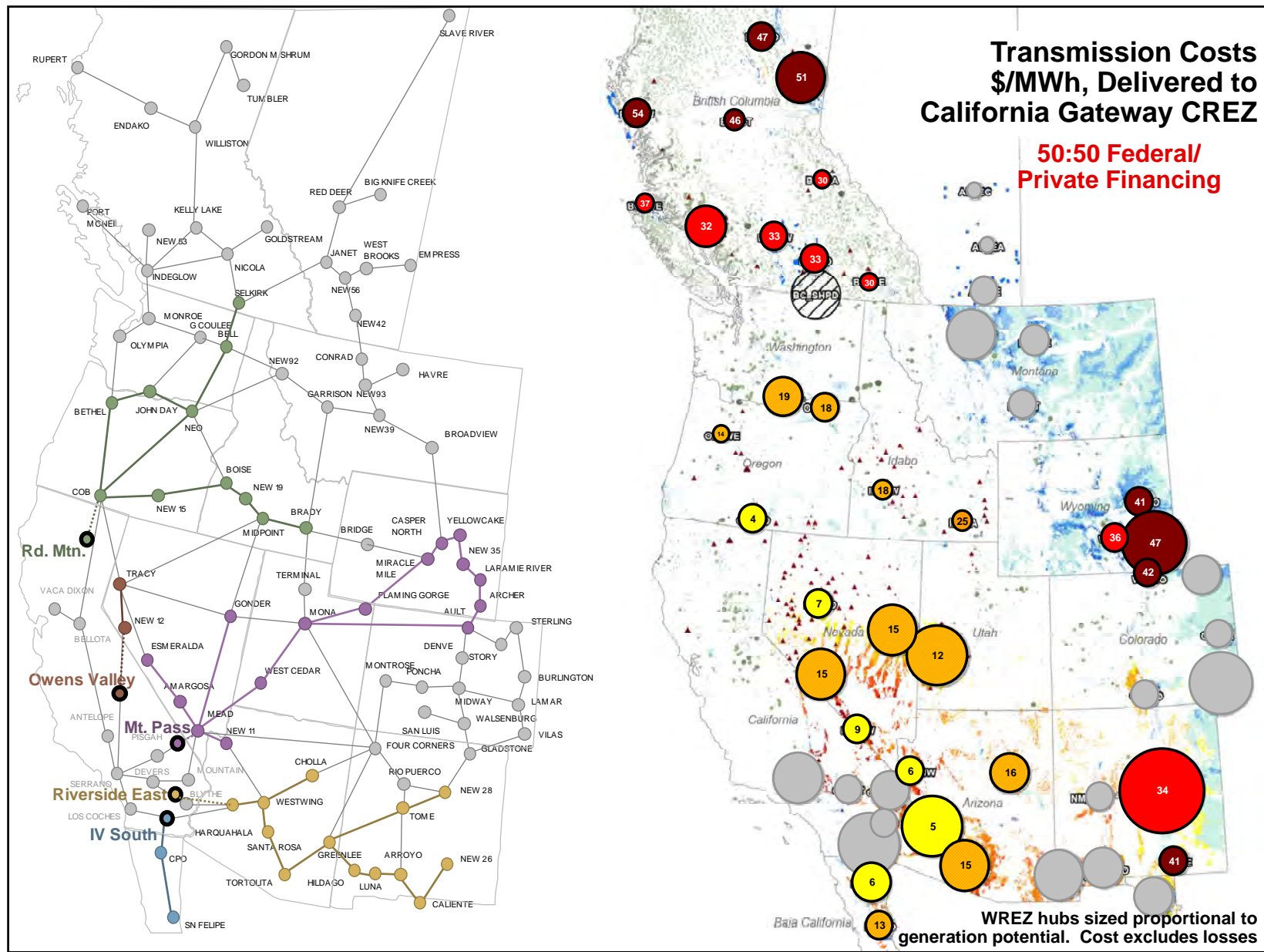
## Transmission Cost Approach

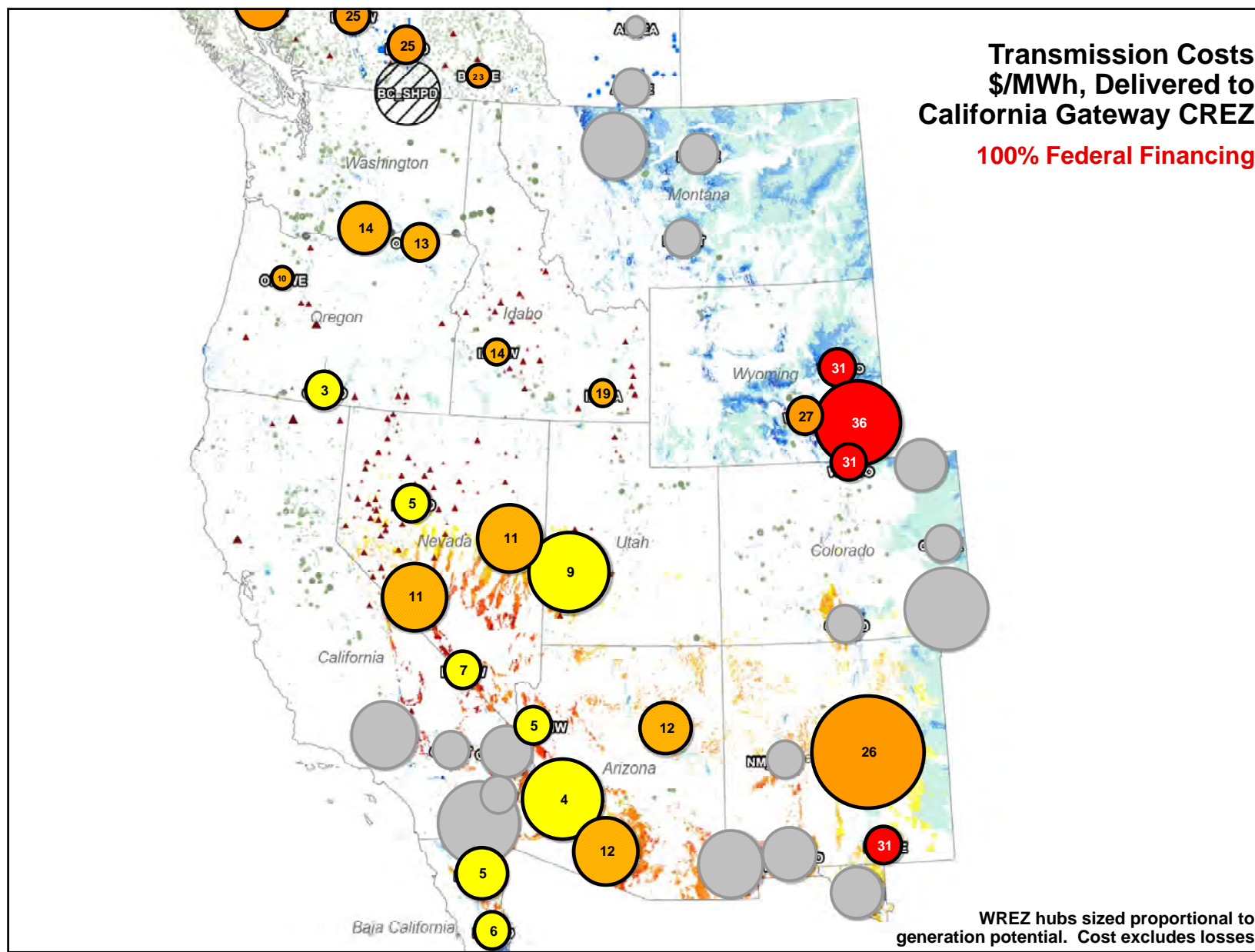
- Out-of-state resources
  - 500 kV single-circuit ac transmission, 1500 MW capacity, \$1.8 million/mile, **50:50 public-private financing**, delivered to “gateway CREZs” (e.g., Mountain Pass)
    - From WREZ Transmission Characteristics Working Group
    - Line utilization based on region-specific factors
- In-state transmission costs:
  - Include all costs for 2A Collector Lines; allocation based on 2A shift factors
  - Include 50% of the 2A Foundation and Delivery Line costs; allocation based on 2A shift factors
  - Use 2A costs, annualized with 10% fixed charge rate

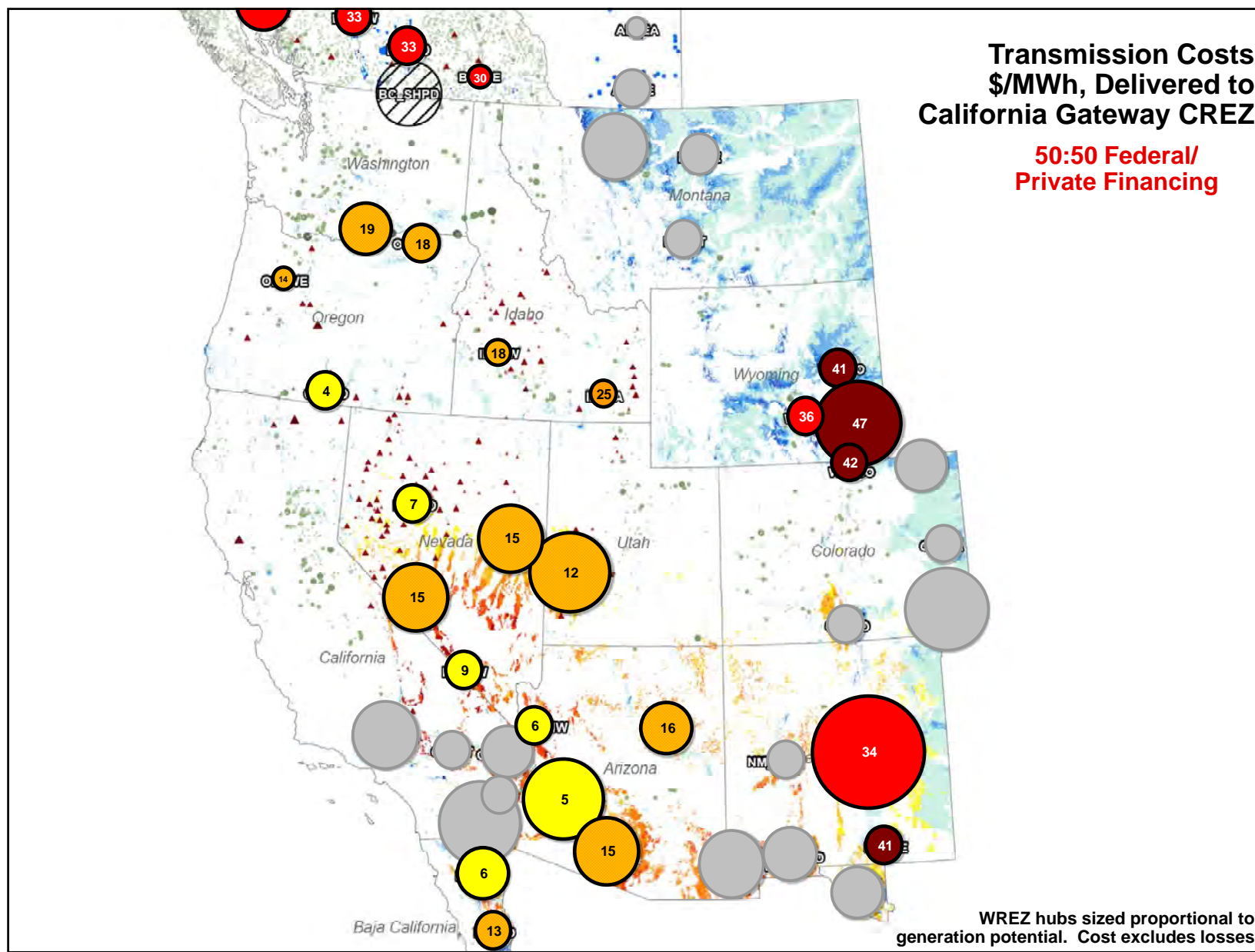
## Financing Assumptions

	Federal	IOU (UREZ)	Blended
Economic Life	40	20	40
Debt Percentage	100%	60%	60%
Debt Term	30	20	30
Interest Rate	5.0%	7.0%	6.0%
Equity Cost	—	11.0%	11.0%
Tax Life	—	15	15
Discount Rate	5.0%	8.6%	7.5%
Tax Rate	—	38%	38%
Non-Capital Costs	3%	3%	3%







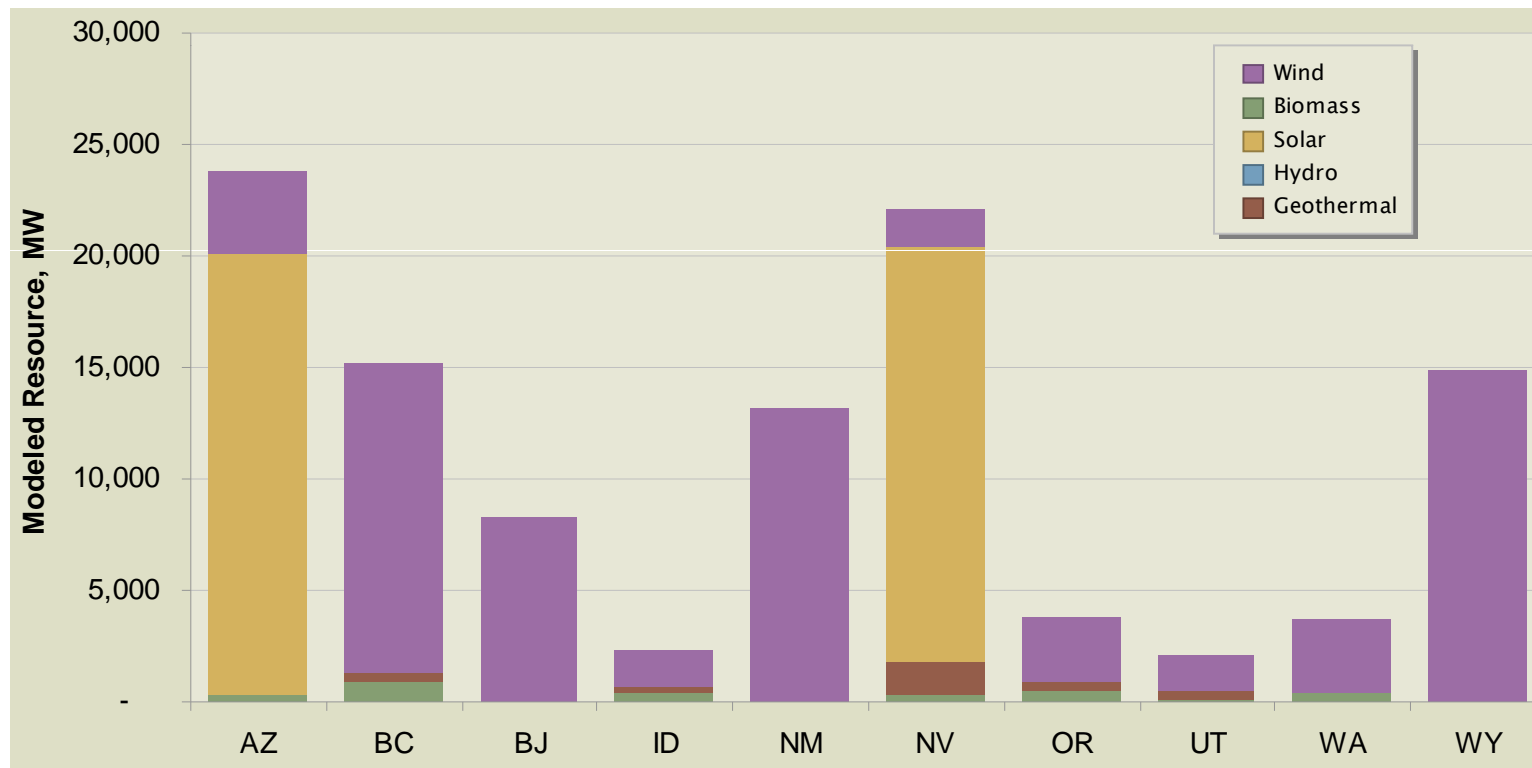


## Final Recommendations for Out-of-State Resource Estimates (MW)

State	Biomass	Geothermal	Solar	Wind	Total
AZ	329		19,782	3,714	23,825
BC	939	340		13,942	15,221
BJ				8,305	8,305
ID	358	329		1,649	2,336
NM				13,186	13,186
NV	299	1,467	18,588	1,754	22,107
OR	454	403		2,913	3,770
UT	90	375		1,679	2,144
WA	449			3,262	3,711
WY				14,853	14,853
<b>Total</b>	<b>2,918</b>	<b>2,914</b>	<b>38,370</b>	<b>65,257</b>	<b>109,459</b>

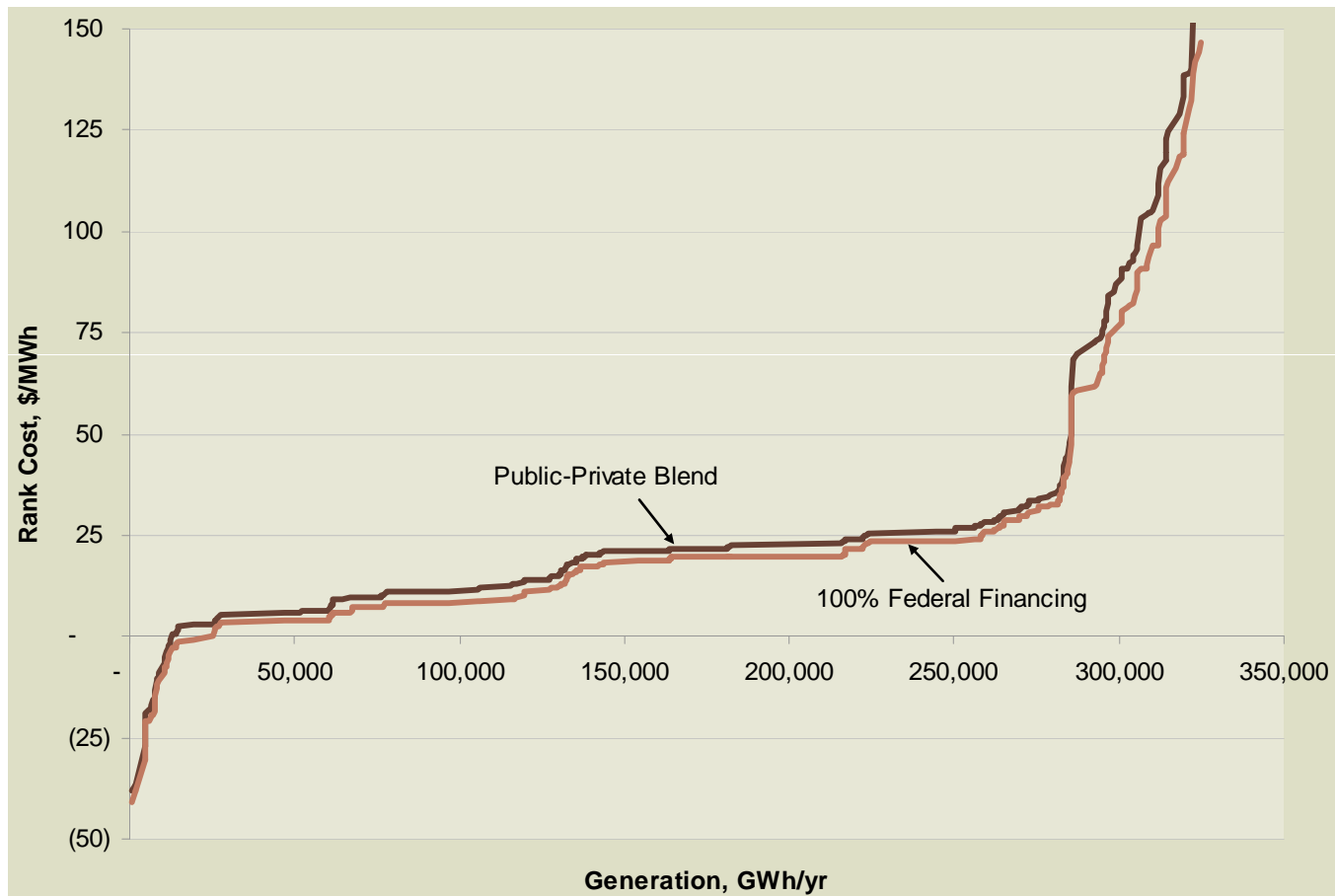
Notes: Oregon geothermal in WREZ includes northern California resources. Removed to prevent double counting.  
 Removed NV geothermal already under contract to NV Energy. Solar estimate is for either PV or solar thermal

## Final Recommendations for Out-of-State Resource Estimates (MW)

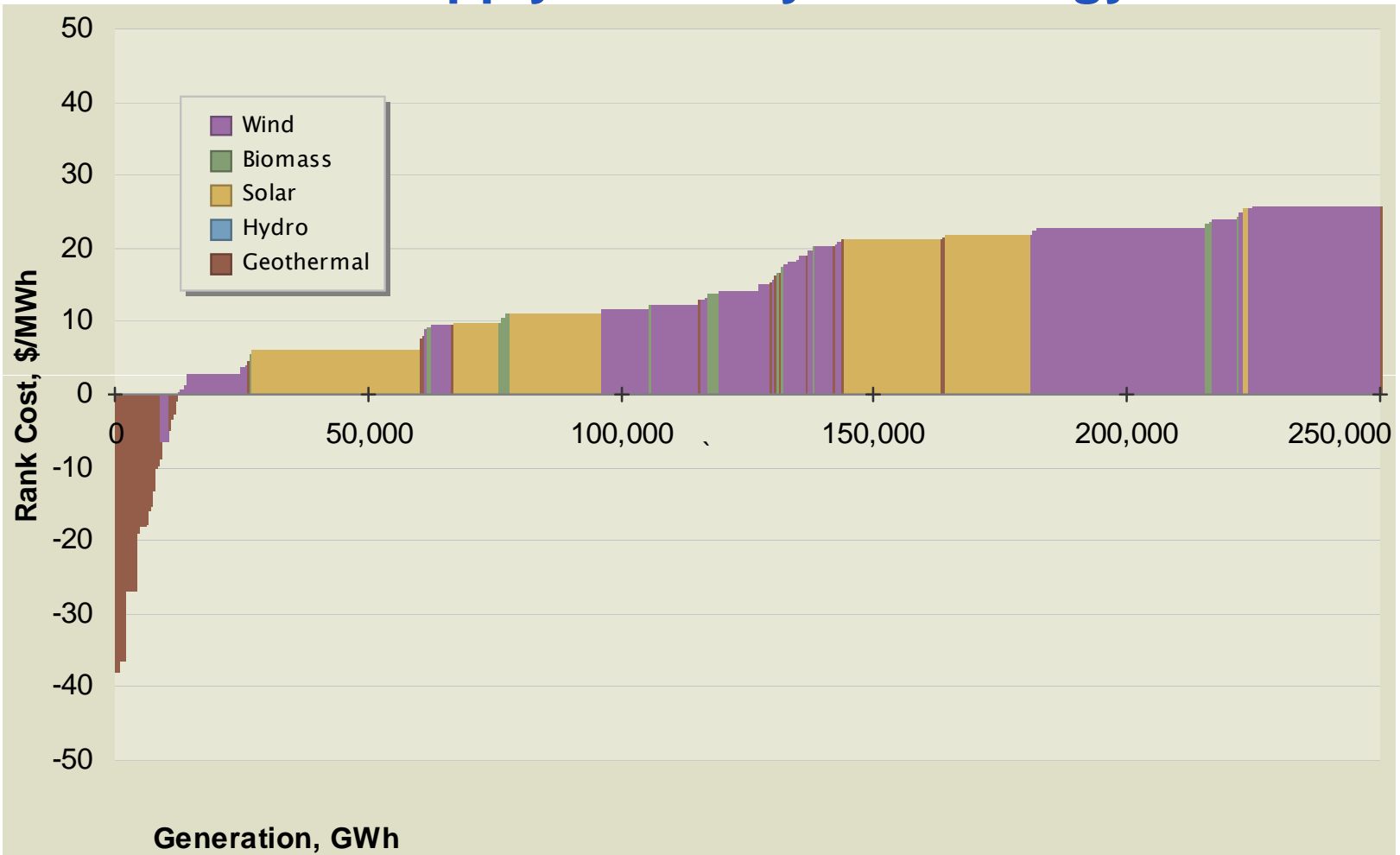


## Out-of-State Supply Curve

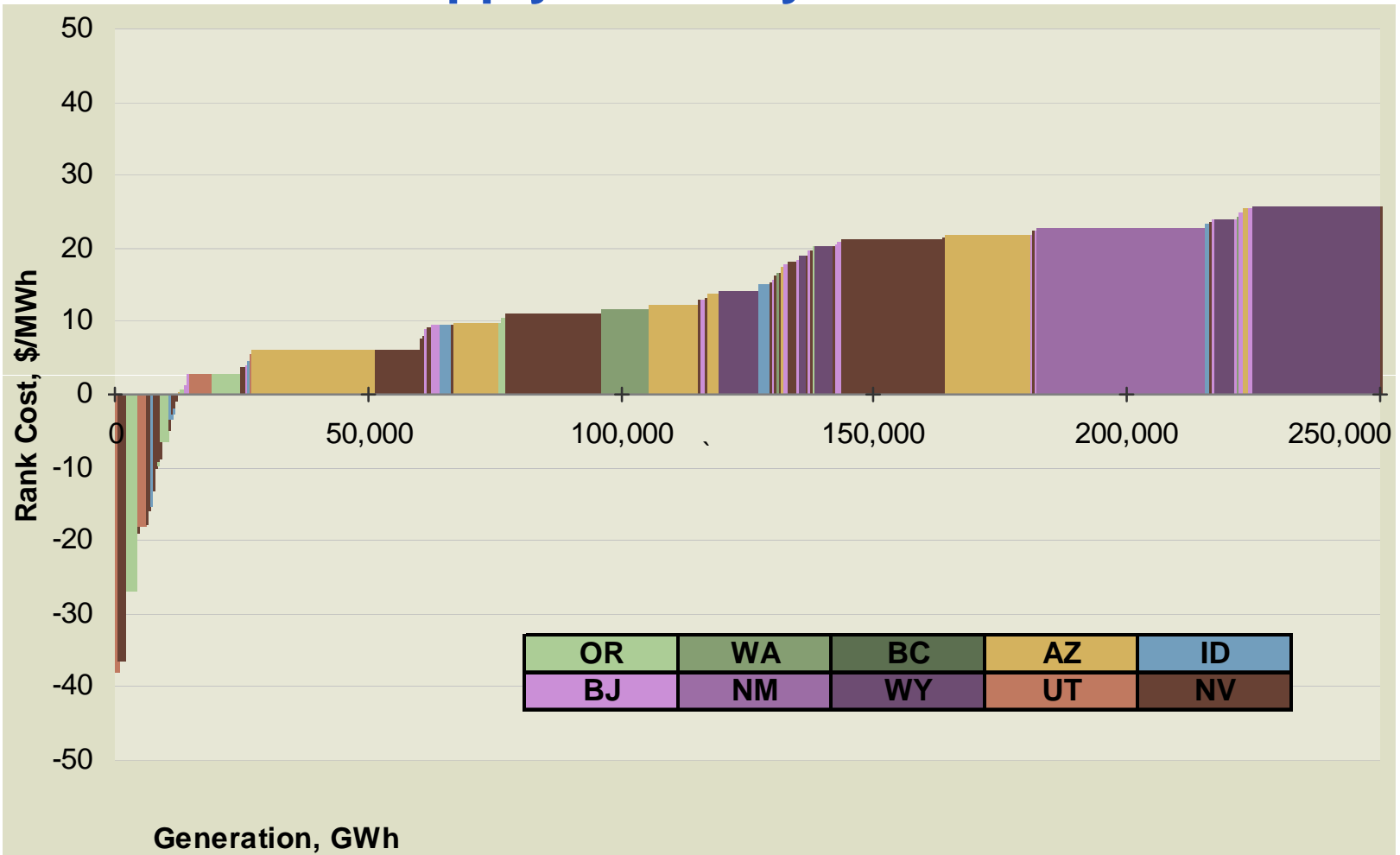
Rank Cost, \$/MWh – Delivered to California Gateway CREZs



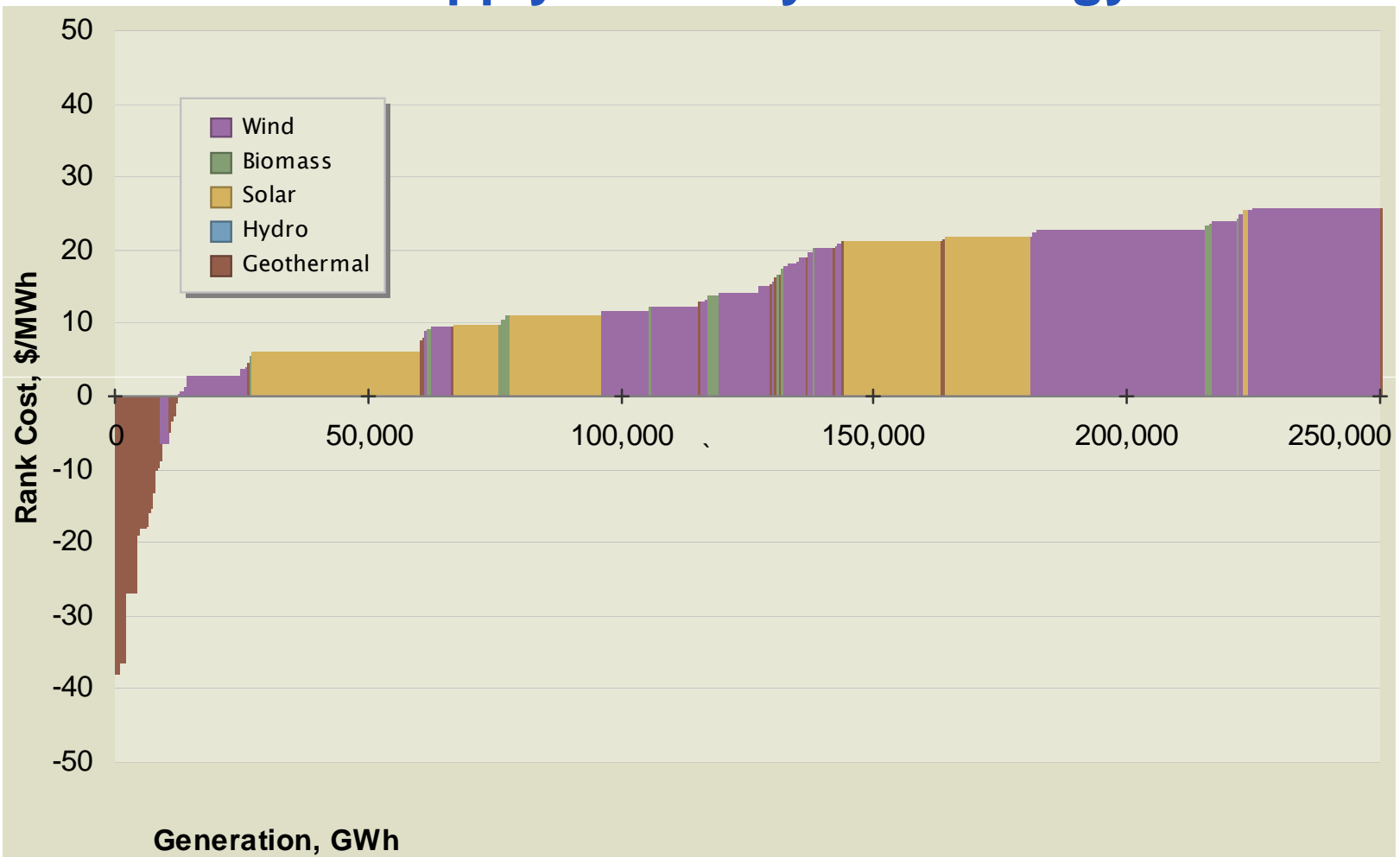
## Out-of-State Supply Curve by Technology



## Out-of-State Supply Curve by State



## Out-of-State Supply Curve by Technology



## Steps To Finish

- Finalize CA GIS Shapefiles and reconcile any differences
- Incorporate “20 MW” distributed PV projects
- Include in-state transmission costs
- Re-run overall supply curve model
- Bubble chart
- Perform sensitivity and uncertainty analysis

**Thank You!**

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